$45 = 12(3) + 9$
$12 = 9(1) + 3$
$9 = 3(3) + 0$

$9 = 45 - 12(3)$
$3 = 12 - 9(1)$

$$\begin{aligned} 45 &= 12(3) + 9 \\ 12 &= 9(1) + 3 \\ 9 &= 3(3) + 0 \end{aligned} \qquad \begin{aligned} 9 &= 45 + 12(-3) \\ 3 &= 12 + 9(-1) \end{aligned}$$

$3 = 12 - 9(1)$
$= 12 - (45 - 12(3))(1)$
$= 12 - 45 + 12(3)$
$= 12(4) + 45(-1)$

$$\begin{aligned} 3 &= 12 - \underline{9}(1) \\ &= 12 - \overline{(45 + 12(-3))}(1) \\ &= 12 - \overline{45 + 12(3)} \\ &= 12(4) + 45(-1) \end{aligned}$$

$$\begin{aligned} 245 &= 90(2) + 65 \\ 90 &= 65(1) + 25 \\ 65 &= 25(2) + 15 \\ 25 &= 15(1) + 10 \\ 15 &= 10(1) + 5 \\ 10 &= 5(2) + 0 \end{aligned} \qquad \begin{aligned} 65 &= 245 + 90(-2) \\ 25 &= 90 + 65(-1) \\ 15 &= 65 + 25(-2) \\ 10 &= 25 + 15(-1) \\ 5 &= 15 + 10(-1) \end{aligned}$$

$$\begin{aligned} 5 &= 15 + \underline{10}(-1) \\ &= 15 + \overline{(25 + 15(-1))}(-1) \\ &= 15 + \overline{25(-1) + 15(1)} \\ &= \underline{15}(2) + 25(-1) \\ &= \overline{(65 + 25(-2))}(2) + 25(-1) \\ &= \overline{65(2) + 25(-4)} + 25(-1) \\ &= 65(2) + \underline{25}(-5) \\ &= 65(2) + \overline{(90 + 65(-1))}(-5) \\ &= 65(2) + \overline{90(-5) + 65(5)} \\ &= \underline{65}(7) + 90(-5) \\ &= \overline{(245 + 90(-2))}(7) + 90(-5) \\ &= \overline{245(7) + 90(-14)} + 90(-5) \\ &= 245(7) + 90(-19) \end{aligned}$$

The target to gather together is always a prior remainder. Substitution is in reverse order of above right equations.